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Marching Up Country:
Autonomous Warfare, a New Doctrine

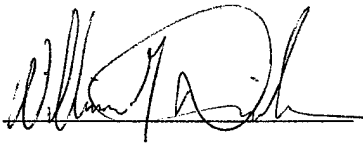
by

William G. Davidson
Captain, USCG

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The views expressed are those of the author and do not reflect the views of the Naval War College or the United States Coast Guard.

Signature

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Naval War College CNW 06-01

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ABSTRACT

A new form of warfare is emerging due to the dominance of Joint Integrated Warfare and the dispersion of advance technology and Weapons of Mass Destruction. This new warfare is the antithesis of the dominant Joint Integrated Warfare. Best fitted for the weaker side in a modern conflict, this defensive doctrine takes in to accord both modern destructive weapons and the dispersion of those weapons to the smallest elements of an armed force. The new doctrine already exists in the military thought of those who have to plan conflict with an integrated force.

A thesis and antithesis methodology shows both the potential and the weaknesses of the new doctrine. Additionally, an existing new doctrine, the Chinese doctrinal concept of *Unrestricted Warfare*, provides a potential synthesis.

...Phalinus said: "The king claims to have conquered, because he has put Cyrus to death; and who is there now to claim the kingdom as against himself? He further flatters himself that you also are in his power, since he holds you in the heart of his country, hemmed in by impassable rivers; and he can at any moment bring against you a multitude so vast that even if leave were given to rise and slay you could not kill them." After him Theopompus the Athenian spoke. "Phalinus," he said, "at this instant, as you yourself can see, we have nothing left but our arms and our valour. If we keep the former we imagine we can make use of the latter; but if we deliver up our arms we shall presently be robbed of our lives. Do not suppose then that we are going to give up to you the only good things which we possess. We prefer to keep them; and by their help we will do battle with you for the good things which are yours." Phalinus laughed when he heard those words...

Xenophon, Anabasis.

Introduction

Xenophon, isolated, surrounded by chaos and without support led an army of Greeks out of the wilderness, “marching up country” through a collapsing Persian empire. Trained, disciplined and resilient, the Greek phalanx threw off the pursuit of more numerous enemies. Xenophon’s unit of highly integrated and technologically superior and disciplined Greek troops marching through more numerous armies of the Persian Empire became the model for Alexander the Great. It showed the power of discipline, married to technological superiority, in order to achieve military dominance. The unit was an example of the integration of capabilities and command that dominated the battlefield. Nevertheless, this smaller, isolated force was also an early example of an antithetical trend of a small autonomous force operating in chaos. Moreover, the quest for military results in an environment of chaos is changing the doctrines of warfare.

War is undergoing profound shifts and changes. There is emerging an embryonic new form of warfare.¹ This form of warfare is termed Autonomous Warfare in this paper. Technological developments have created the conditions for a new doctrine that interacts with today’s dominant doctrine. The dominant doctrine, built on the classical principles of war, is that of the joint integrated forces of the United States and NATO. However, those who would oppose the overwhelming dominance of modern integrated armed forces need an alternative doctrine. That new doctrine is emerging made both necessary and possible by the technological trends that place potent military power into smaller and increasingly discrete packages.

Military thought is reacting to the presence of this new form of warfare. In nations potentially facing the challenge of military action against a complex integrated force new

doctrines such as *Unrestricted Warfare* have emerged. Nevertheless, even in the United States doctrinal changes, such as the Naval concept of *Streetfighter*, are emerging that seek to incorporate elements of this new antithetical doctrine of warfare into the dominant one of integrated forces.²

This antithetical doctrine of warfare is Autonomous Warfare (AW). Built on the discrete, highly destructive elements of power, widely dispersed through the entire depth of the battlespace, the doctrine calls for autonomous units. The intent of military commanders welds these units together with doctrine. The logic of this doctrine is the achievement of the complete disruption of integration in order to achieve the culmination of an opposing modern integrated force.³ This culmination will allow the autonomous forces to achieve objectives free of the coordinated resistance of the enemy.

Background

This new way of warfare has existed in military conflicts through out the ages, but lacked the methods and means necessary for full application. War has as its basic elements, confusion and friction. Great commanders have always sought to use this to sow confusion in the enemy's ranks. Perhaps Genghis Khan was the best practitioner of this strain of warfare. It is a doctrine of sowing terror and confusion and then emerging from that creative chaos to deliver the decisive blow.⁴ In the tradition of Sun Tzu, it has usually been found through maintenance of the commander's own order while destroying the enemies:

In the tumult and uproar the battle seems chaotic, but there is not disorder...

Apparent confusion is a product of good order...

Order and disorder depend on organization...⁵

The nature of modern war with its disparity between opponents and the available technology makes this strain in military thought even more pronounced.

Autonomous Warfare (AW) doctrine is, in part, recourse to confusion. It often requires the use of complete chaos in the battlespace. In this chaos, independent operations take place without the classical operational integration of forces or the network linkage proposed for the future. These types of operations are extremely difficult. In fact, some say that by definition operations in chaos cannot be successful.⁶

The AW doctrine, nonetheless, deals closely with military action in chaotic conditions, even embracing the chaos. It is a doctrinal choice forced on relatively weak militaries without the ability to act in the face of a joint integrated force. Within the modern battlespace, the attacks of the stronger force chaos on the weakest. Since the weakest combatant must plan for his own operations in chaotic conditions, by creating chaos for the strong combatant, the weaker levels the field. Fortunately, for the weaker military the pace of technological advances that made integration possible has also brought to the fore the destructive elements needed for a potentially effective Autonomous Warfare doctrine.

The integrated warfare doctrine is expressed in the concepts of linkage like Network Centric Warfare (NCW). "Instead of considering platforms as autonomous stand-alone entities," this new type of integrated control system sees units as nodes in the greater system.⁷ This integrated networked system will help dominate the battlespace. Logically, this pursuit of "full-spectrum dominance" will create an antithesis. Autonomous warfare is just such an anti-thesis.

Chaos in small packages

The elder Moltke famously noted “that no plan survives contact with the enemy”. Western military thought has reacted to this maxim in many ways. The development of complex plans in central areas and the execution of those plans in the field has been the most promising method. American military doctrine includes centralized planning and decentralized execution. It seeks to arm the operational unit with the foreknowledge and insight in the commander’s intent to operate effectively in an environment of great friction.⁸

Yet, since Moltke’s era, the means of destruction have undergone a radical shift. Today single units have destructive power greater than a 1870’s corps dispersed over a much larger area. This trend is accelerating. New devastating weapons and their effects are creating the potential of complete chaos as a battlespace condition of operation. The practitioner of war seizes this, forging a method of operation from the potential devolution of strategic and operational initiative to the unit level and individual level.

Soviet military thinkers in the 1980’s foresaw this trend as one of the future conditions of warfare. Future war was to include the following factors:

- Extremely high density, dynamic, and rapidly developing operations.
- Broad global extent, including operations in space.
- Extremely destructive combat of unprecedented scale.
- Fragmented combat. Disappearance of the “frontline”...
- No country or region would be safe from enemy action, since no “deep rear” would exist beyond the range of future weapons.⁹

New weapons and their strategic proliferation and operational dispersal have made these characteristics a reality.

By the end of the Cold War, the criticality of single units, even down to individual silos and SSBN’s in the conduct of potential nuclear war was clear. Their operation in

conditions in an environment of a potential profound degradation was central to the faint hope of either survival or victory denial.¹⁰

The trend toward this critically of individual units emerged clearly over the course of the last major war. The integrated and, in some ways, networked, attacks of the Imperial Japanese Navy on Pearl Harbor began World War II in the Pacific. The war ended with the lone *Enola Gay*. Power had moved from the superiority of integrated units of vast sizes and diverse networked carriers and supporting units to the even more massive power of one individual aircrew to make its attack. Of course, other units operations and preparations supported *Enola Gay*'s flight, but the trend of technological destructiveness in smaller units is clear. Small packages, even carried by individual units, or today by individual people who are not even soldiers, can have profound tactical, operational or even strategic results.¹¹

The Means of Destruction

Newer highly destructive and discrete weapons have continued to emerge since the 1980's. This new military doctrine seeks to integrate them to achieve effects from their coordinated use. Indeed, this was even the response to the original emergence of large nuclear forces. Integrated operations plans molded global military effects from the tactical use of what were historically small numbers of forces. Technological developments produced other weapons systems, usually called Weapons of Mass Destruction (WMD), different but parallel in their broad effects. These weapons included chemical and biological warfare devices. Military doctrines had difficulty integrating these new weapons into meaningful operations. They often cause so much degradation of the environment as to make their use counter-productive to integrated military operations.

The destructive power and natural repulsion of humanity to WMD use have masked a profound revolution in the means of destruction. The employment of such weapons can create the conditions where integrated operations can no longer be fully effective. During the 1997 "Army After Next" winter war game, attacks by the war game opposition on space systems and communications targets followed broad area effect weapons, disrupting friendly force integration effectiveness by fifty per cent.¹²

When only the stronger side in a conflict has the new weapons systems, they actually can improve the conditions of integration for that stronger force. The threat of the use of these weapons forces a weaker integrated military force to disperse while the superior force can concentrate at will. This makes the trend of technological development seem to favor offensive operations. This situation and the use of rifles and machine guns in the late 1800's colonial conflicts are analogous. Technologically advanced European armies destroyed native forces that attempted concentration on the battlefield. This made possible very successful European offensive operations. However, in 1914, Europeans faced similarly armed and integrated forces with much different results.

Responding to AW with Integration Networks

Integrated forces are responding, in part, to the threat of opponents who might be able to degrade battlespace conditions. The new proposed model for the integrated force is that of dispersed units acting in virtual concentration. This is the *massing of effects*, not forces, in the new alternative concept of Network Centric Warfare.¹³

This type of dispersal of communications is the descendent of the networks of communication built in the Cold War to potentially survive Nuclear War conditions. Network systems have the advantages of redundancy and interconnected to survive an

attack. In addition, the maturity of the satellite moved the network into space. Existing extensive and interconnected nodal communications, like the Internet, were in part, a defense communications system.¹⁴ This type of network connection has continued to maintain control in the battlespace.

Yet, the costs of the means of destruction and their proliferation have challenged even the lowering costs of the means of communications. Dispersal of WMD capabilities and other highly destructive weapons to new nations, non-governmental organizations and individuals has created a danger to the integrated command of forces. The destructive power of the modern weapon and the dispersion of the means of destructive power have progressed from the units like the super carriers to that of the potential of smaller vessels, even commercial ships, to carry and launch cruise missiles or other massively destructive weapons. Individuals, not even trained as soldiers, can now carry, without much outward sign, weapons that would quickly destroy Xenophon's command. This destructive force concentrated in non-integrated or networked forces threatens to shift the balance from mass armies, air forces and navies to autonomous units.

Sowing Attrition and Chaos

The classic example of this type of operational force is the mine. The potential of the mine to deny battlespace access to one side or the other was clear from the first introduction. Navies then armies, and potentially air and space forces, have been, or will be, denied free maneuver by the introduction of mining. In fact, the development of air and space forces themselves can be seen as a movement away from the friction of land and sea combat in order to maintain the ability to maneuver. However, attrition elements, like the more expensive beam weapons, or the mine can deny the free use of air or space.

Indeed, as the destructive power and technical intelligence of the mine and its technological descendants improves, they become both more precise in targeting and less detectable. At the same time, mines placed throughout the wider world, like destructive weeds, have grown in number with the technological ease of manufacture. The tension in warfare toward between new precise but expensive systems of destruction and less precise and horribly detectable (even by the innocent) ones, further builds the AW foundation. This marriage of destructive force in very small and potentially, highly intelligent units is forcing a sea change in warfare.

The Doctrine of Autonomous Warfare

The new doctrine of warfare is that of autonomous warfare. It is the creation of independent operational units for achieving strategic results by both the use of massive destructive strikes throughout the depth of the enemies' battlespace and the creation of unit level decision-making to survive the destruction of linkage and communication. It is, in effect, broad area denial in all spectrums of conflict to de-link and de-integrate enemy forces in order to achieve collapse of structure. AW is already the hidden hand of counter integrated warfare. The goal of Autonomous Warfare is the *creation and maintenance of profound and persistent chaos* in all portions of the battlespace, even as necessary to friendly ones, in order *to achieve the freedom or equality of maneuver and strike of independent vectors of destruction.*

There is nothing noble about this doctrine of warfare. Combatants take it up under the threat of expanding technological capability. It is the grasping of weakness as a strength and chaos as a leveling factor in conflict. It does not seek to avoid friction but increase it,

even on its own side, to over task the integrated force as to bring about their culmination. It is a technological Peoples War. It is more the child of Mao than of Clausewitz.¹⁵

However, in the past even the United States has come close to adopting AW type doctrine when faced by overwhelming opposition. The introduction of weapons of mass destruction in the face of the superior size of the Soviet Union's massive land army in addition to the unknown effects of nuclear weapons on the battlefield led to the creation of the *Pentomic Army*. This force was composed of dispersed battle groups with great inherent firepower, including nuclear artillery.¹⁶

It is not surprising when elements of Autonomous Warfare type doctrine appear in Chinese military thought. Chinese military thought has to consider operations in opposition to a powerful integrated force with networked systems. Their military response, therefore, has strong themes from Autonomous Warfare. This explains, in part, the adoption of mobile, highly automated ICBM launchers and the dispute over the purchase of smaller missile ships and submarines instead of a carrier force for the future.¹⁷

There has even been an effort to reintroduce elements of AW back into U.S. force planning. The Marine Corps has experimented with the empowerment of individual units in, what is termed, "infestation" operations. Small units call in stand off precision weapons to maximize both the small unit and precision weapon's effects. While the 1997 experiment, called *Hunter Warrior*, was tactical in nature, and not at the operational level, it did uncover similar limitations to those outlined later in Autonomous Warfare Doctrine. These included logistical shortfalls and control of forces for the infestation teams. Additionally, the small teams relied on communications for stand off weapons

support, with no inherent broad effect capability themselves. Nonetheless, this experiment did point out the potential of small teams to disrupt and disperse much larger forces for achieving meaningful operational objectives.¹⁸

The AW in Impact on Modern Warfare Trends

The logic of the underlying AW Doctrine brings to the fore new warfare methods. Asymmetrical warfare and the widening of types of Weapons of Mass Destruction are examples of such methods of Autonomous Warfare in the present.

Asymmetrical actions are often the operational interaction of integrated systems and the alternatively powerful independent unit. The power available to the individual or small units acting, both in force and information, in the global environment make individuals potentially operationally important. Tactical actions can have direct strategic results due to the destructive effectiveness of modern weapons and the profusion of information access. The individual, whether sitting at a computer in the Philippines or in a small boat in Aden can effect dramatically the military operations of integrated forces. Potentially, the employment of forces in correspondence to the AW doctrine, even in peacetime, can create a sufficient threat of destruction to drive the requirement for unit self-protection up, degrading sensor spread and access for the network.

The second methodology of AW is the growth in the types of weapon of mass destruction (WMD). While this term has often become synonymous with Nuclear, Chemical and Biological (NBC) weapons, weapons of mass destruction are weapons whose proper employment destroys the broad integrity or forces of the enemy. Properly understood, jamming weapons and psychological warfare are WMD weapons in the AW doctrine, since they have the potential to destroy the ability of enemy forces to operate.

Other good examples of true weapons of mass destruction in the AW lexicon are the “E-Bomb” and “Psychotronic War”.¹⁹ The disruption and degradation of the opposition’s operations, even at the cost of creating the same effect in friendly forces, is an AW methodology, such weapons fit the bill well. Autonomous Warfare WMD also includes the potential beam and ray weapons.

Even within Integrated Doctrine, responses to the potential of AW already exist, as in the developing doctrine of Network Centric Warfare. In theory, the network systems will widen the understanding of the commander’s intent. Then, if the network is degraded, operating forces will be able to use that intent to still achieve operational goals. Nevertheless, the nature of AW requires even more than this. The mobile battlefield of the future, with its huge operational depth and fluid nature will make even seconds old information increasingly useless.

Autonomous Warfare requires a doctrine grounded in truly independent operation. Units and individual soldiers must have a unity of operation that creates persistent and enduring individual capacity. Sensors and decision-making must be at the unit level. While connections are maintained for as long as possible, the doctrine requires the continuation of operationally prolonged operations without dependence on linkage in combat. Robotics and survivable units and soldiers may well have to act for protracted periods in a wholly non-permissive environment.

Limitations of Autonomous Doctrine

The success at developing the ability to operate on an operationally protracted basis in an autonomous manner will help diminish the desire of the combatants to push the operating environment to that state. However, several significant technological and

doctrinal limitations must be resolved before the employment of an effective autonomous warfare doctrine. These include the logistical problems, the sensor balance and the command of forces.

The greatest practical limitations of Autonomous Warfare will be logistical. Weapon-individual units that can be withdrawn and will have to be re-supplied and re-armed in a battlefield without sanctuary. The development of re-charging units from potential environmental resources such as solar or thermal energy are possible solutions to this, others include hydrogen extraction and stored high energy in such things as nuclear devices to power advanced systems.

The ability to maintain sensors, or recover them, in this environment of creatively destructive disruption will be center to achieving results at the critical points in the conflict. These critical points may well move fluidly in time. Sensors will have to provide the necessary information to allow the re-formation of forces, at least on an ad hoc basis to achieve broader strategic objectives.

Space based sensors offer initially a way around the non-permissive environment created by the destructive forces of modern war. However, as with the airplane before them, such a strategy creates an interaction that will bring space into the same destructive condition over time. In fact, space is a perfect environment in some ways for both the wide area effects of modern weapons of mass destruction and their precision based destructive force. The high ground in the modern battlefield may only make a better target.

Earth based sensors, especially those inherent in the unit, will probably be the main sensor of a successful AW doctrine. The destructive effects envisioned reward high levels

of multi-spectrum sensors dispersed in many individual units that can link for improved performance but are not dependent on networking for operation. This is an expensive way to construct forces, creating redundant capability over an entire force. Nevertheless, the destructive effects of modern weapons and capabilities will too often divorce units from merely shared capacity.

The last limitation is the most perplexing since it goes to the heart of Autonomous Warfare's rational. Initially, the only solution that would appear reasonable is the same adopted by Xenophon. Thorough training and indoctrination of professional forces over a pro-longed period are the basis of control. The result is that each element thoroughly understands and can act effectively in the confusion and dispersion of the battlespace. Using the discipline and training, the individual may be able to respond, as Theopompus the Athenian recommended, valor with creativity in arms.²⁰ This requires a complete re-thinking of command and control relationships.

The focus of command should be from the operationally effective unit, supported both by any remaining units that may be still networked. Some of this is inherent in the nodal structure of NCW network command linkages as well. In contrast, de-integration of command defines the AW doctrine of command. De-integration will require the abandonment of rank based command and a movement to fluid task based command. The unit, robot or individual with the critical insight has to direct the action.

Resiliency is the AW principle for the devolution of authority and command within the disrupted battlespace. Modeled on the structure of modern criminal organizations that survive under constant pressure from law enforcement, the AW principle of resiliency is a loose, even ad hoc, structure of individuals and units brought together for particular

tasks.²¹ These linkage structures would form up around openly devised, simple tasks. These types of tasks are easier for surviving individual units to identify without significant linkage. The result is large numbers of simple and inherently robust units or individuals, surviving to accomplish their tasks despite suppression. Compared to the elegant network of NCW, the organization of an AW warfare unit will be more like a criminal enterprise.

Problems of Autonomous Warfare

The Autonomous Warfare Doctrine outlined here has a negative, destructive character. This is a result of drawing the doctrine in the terms of an “absolute” war in Clausewitzian terms.²² This stark absolute condition makes the comparison with joint integrated warfare clearer. However, as an outgrowth of using this method, the resulting doctrine has significant problems that make it difficult to execute as a practical war-fighting doctrine. The main weaknesses of AW come from its strength of independent operation. This independence creates dangerous problems for those who choose the doctrine. The most dangerous of these are its potential for loss of focus on meaningful objectives, its escalatory nature and its temptation to employ non-proportional force.

The potential loss of focus on objectives is a function of the ad hoc nature of network connections available in the disrupted environment. The rapid pace of activities in the combat or conflict environment creates a difficult dilemma. Simplification of plans can only go so far. Prior training will improve performance but new and constantly changing conditions will weaken the utility of that prior training as quickly as it ages the value of old information about conditions. A potential assistance for helping to solve this dilemma is the development of Autonomous Control Theory used now in mine clearance vehicles

and other UAVs.²³ This technology may allow a prolongation of the individual unit's effective operation. Nevertheless, the issue of the loss of control over time is a significant threat to AW doctrine practitioners.

Operational objectives will be difficult to identify much less achieve. Protracted operations might diminish into exchanges of destruction, similar to that envisioned in the end of strategic nuclear exchanges, where each side blindly "bounces the rumble". As control in this environment devolves under the pressure of the AW targeting logic, bringing the stronger power down to the weaker power's level, both sides may face destruction. This trend is happening today in the destructive exchanges of asymmetric attacks and responses. The resulting principle of AW is devolution to a strategy of denial of victory directed toward stronger, integrated forces.

The loss of control can result in an escalation of the conflict. The widening of targets and the adoption of forms of WMD all create powerful forces that can undo the intentions of the AW practitioner. Much of the integrated control of force in a modern army is there to prevent escalation and control the beginning and end of the use of force for political purpose, as Clausewitzian thought requires. However, autonomous warfare disrupts control on both friendly and enemy forces and creates a potential for destructive escalation. Of course, this very fear on the part of advanced armies might deter them from commencing a conflict with a force using AW but it is dangerous.

The broad indiscriminate nature of an AW approach to warfare, that includes the use of WMD at some level, raises profound issues of autonomous warfare's potential for non-proportionality.²⁴ The desire for victory-denial by the defensive side might blind the practitioners of the cost of this method of warfare – the potentially horrific effects on

innocents. The danger of non-proportionality weighs against this doctrine of war.

Nevertheless, the press of the means of destructions, and the resulting logic of a doctrine that uses it, raises the dangers of a non-proportional strategy to disrupt in great depth an integrated force to deny or delay victory to the stronger force.

Synthesis

The negative character of Autonomous Warfare requires a more practical formulation to achieve its potential as more than a comparison with integrated warfare doctrines. In order to retain enough positive elements to be militarily useful and not be a mere doctrine of vengeance, this negative antithesis of the more proactive integrated warfare requires a reformulation. This synthesis has to retain enough positive elements to be operationally more useful.

The comparison of the principles of war under Integrated (and NCW), Unrestricted, and Autonomous warfare (Table 1) suggests such a synthesis within the Unrestricted War doctrine.

Table 1. Comparison of Principles of Warfare

<i>Joint Warfare (NCW)</i>	<i>Unrestricted</i>	<i>Autonomous</i>
Objective	Limited objectives	Denial
Offensive	Unlimited measures	Defensive
Mass	Asymmetry	Dispersal
Economy of force	Minimal consumption	Survivability
Maneuver	Omnidirectionality	Broad Disruption
Unity of command	Adjustment and control	Initiative
Security	----	Openness
Surprise	Synchrony	Deception
Simplicity	Multidimensional	Resiliency
	Coordination	

Sources: Integrated warfare from Joint Pub 1, vii-viii; Unrestricted from Qiao Lang and Wang Xiangsui, 233. Note: Principles from Unrestricted Warfare reordered for comparison purposes.

The Principles of Autonomous Warfare are *Denial, Defensive, Dispersal, Survivability, Broad Disruption, Initiative, Openness, Deception* and *Resiliency*. These principles are reflective of the discussion above. The principle of denial in AW is an outgrowth of the denial of victory of a weaker force against a modern integrated force.

The defensive principle is the outgrowth of the limits of achievable action in a non-permissive environment. A shift to offensive operations may be possible after the attacker culminates.

Dispersal is necessary because of the destructive nature of weapons and to present more difficult targeting and more directions of attack to the enemy.

Survivability is necessary to continue the struggle until the enemy is exhausted.

Broad disruption is necessary to prohibit sanctuary to the enemy for the re-

constitution of forces and command and control.

Initiative is required to achieve the attack in independent forces acting outside of command toward an objective over protracted disruption.

Openness allows any surviving units to have a better chance of determining conditions. True openness would allow the communication of conditions and intentions through the enemies' communications means to the AW practitioner's forces. This may happen either through the conduct of the enemy's operation or his media.

Deception is the heart of chaos and is much more than just surprise, creating increased confusion and chaos, amplifying the broad effect weapons and protecting units.

Finally, the principle of resiliency is necessary in order for force to continue beyond the culmination point of the enemy with sufficient abilities to starve off further action and begin re-constitution into some level of integrated action for the counter-offensive.

The concept of Unrestricted Warfare, developed by Qiao Lang and Wang Xiangsui, is a type of synthesis of AW and the Joint Principles of Warfare. Obviously, the Unrestricted Warfare concept is original, developed separately from the AW warfare discussed here, yet it has in its structure a type of merging of the negative aspects of AW and the more positive, offensive one of Joint (Integrated) Warfare. The Unrestricted Warfare principles are *Omnidirectionality, Synchrony, Limited objectives, Unlimited measures, Asymmetry, Minimal consumption, Multidimensional coordination*, as well as *Adjustment and control of the entire process*.²⁵

The Unrestricted Warfare principles present a more positive vision of control throughout the conflict and a focus on objectives that may allow expanded war aims beyond victory denial. However, the dangerous problem of the destructive power of

modern weapons and the capabilities of individual units operating under disruption of the whole depth of the battlespace remains despite a slightly more positive military doctrine. Perhaps only the stark military determinism of the AW doctrine can make Unrestricted Warfare seem more positive.

Reflections and Conclusion

The logic of autonomous warfare is a cold logic, destructive and isolated operations in a much-degraded environment. It has elements of its logic that are illegal and immoral in the conduct of war. Nevertheless, the tension and technological capacity remains whether embraced or not. The potential of Autonomous Warfare and its interaction with the full spectrum dominance envisioned in the doctrine of integrated warfare is too important. It is not necessary to advocate all the elements of AW, especially where it is counter to Just War doctrine, to have to deal with its dangers and opportunities.

Conclusion

The development of the means of destruction and means of control interact in a cauldron with war's grim logic. The result is this embryonic form of warfare, dubbed here Autonomous Warfare. It has few noble or redeeming qualities but those of necessity from weakness. However, in war that is a powerful quality indeed. Militaries will face the use of, or the have to respond to this doctrine, regardless of their desires.

This trend of broad destructive power and small packaging of that power has produced the potential of this new doctrine of autonomous warfare. The implications of this new embryonic form of warfare require serious consideration. Autonomous Warfare Doctrine threatens the militaries of today with the same stark fate of Xenophon lonely

Greeks: collapse in the face of destruction or carve out a way home through terrible danger.

Notes

¹ Qiao Lang and Wang Xiangsui, Unrestricted Warfare: Thoughts on War and Strategy in a Global Era (People's Liberation Army Arts Publishers: Beijing, 1999).

<<http://www.terrorism.com/documents/unrestricted.pdf>>. [26 April 2001], 6.

² Ibid., for *Unrestricted Warfare*. For a discussion of *Streetfighter* see A. K. Cebrowski, and Wayne P. Hughes, Jr., "Rebalancing the Fleet," Proceedings.

<<http://www.usni.org/Proceedings/Articles99/PROcebwski.htm>> [29 April 2001].

³ This one of the means of the modern integrated force is the disruption of the rear area and command and control of the enemy. Certainly for years Russian military thought, as well American, has focused on achieving this goal. For an example of Soviet thought on this see Jacob W. Kipp, The Russian Military and the Revolution in Military Affairs (Fort Leavenworth, Kansas: Foreign Military Studies Office, 1995), 37, and Patrick Morgan, "The Impact of the Revolution of Military Affairs," The Journal of Strategic Studies, 23.1 (March 2000), 139. Morgan specifically notes that disruption becomes more important against advanced societies. Of course, it should be noted that while Morgan makes these points he comes to a much different formulation of their effect on warfare, arguing for an increase in integrated action. This same theme is reflected in Joint Military Doctrine:

Requiring the enemy disperse forces over a broad area can result in virtual attrition of those forces and complicate enemy planning. At the operational level, joint air, land, sea and special operations, and space forces can enable operations to be extended throughout the theater, denying sanctuary to the enemy.

From Chairman of the Joint Chiefs of Staff, Joint Warfare of the Armed Forces of the United States, Joint Pub 1 (Washington D.C.: Joint Staff, 1995), III-6. This is quoted as on what is termed **extended** operations.

⁴ Genghis Khan's use of terror and deception are the strongest points of comparison. But the Mongols were an offensive force and Autonomous Warfare is naturally a defensive doctrine. The key is to use the strategy in a synthesis that can create positive offensive results as the Khan did. Genghis Khan's use of terror and deception are the strongest points of comparison.

⁵ Sun Tzu, The Art of War, tr. and ed. Samuel B. Griffith (New York: Oxford University Press, 1971), 92-93, Paragraphs nrs. 17-19.

⁶ Edward A. Smith, Jr., "Network-centric Warfare," Naval War College Review, vol. LIV, no. 1 (Winter 2001): 69. Dr. Smith doesn't feel that effective operations can be conducted if both side of a conflict are in chaos. But that is at least the risk necessary to assume in an AW doctrine as the practitioner pushes the conditions toward chaos for the stronger party.

⁷ Peter Layton, "Network-Centric Warfare: A Place in Our Future." Aerospace Centre Working Papers. <<http://www.defense.gov.au/aerospacecentre/publish/paper74.htm>> [26 April 2001], 12.

⁸ CJCS, Joint Pub 1, III-10.

⁹ David M. Glantz, Soviet Military Strategy in the 1990s: Alternative Futures (Carlisle Barracks, Pennsylvania: U.S. Army War College, 1991), 21.

¹⁰ William G. Davidson, "The NIOP; the Naval Integrated Operations Plan," (Unpublished Research Paper, U. S. Defense Intelligence College, Washington, D.C.; 1987), 1.

¹¹ Morgan points out this trend to more destructiveness in smaller units. Morgan, 137. Senior Colonels Qiao Lang and Wang Xiangsui, 222, point out the potential of tactical actions bring combined with actions at the strategic level in "super-tier combinations" to create results.

¹² Ryan Henry and C. Edward Peartree, "Military Theory and Information Warfare," from *Parameters*, (Autumn 1998). <<http://carlisle-www.army.mil.usawc/Parameters/98autumun/henry.htm>> [26 April 2001], 10.

¹³ David S. Alberts, John J. Garstka and Frederick P. Stein, Network Centric Warfare, 2nd Ed. (Washington D.C.: C4ISR Cooperative Research Program, 1999), 90. But the existing Joint Doctrine still refers to concentration as its principle of warfare, CJCS Joint Pub 1, III-2.

¹⁴ Davidson, 54-61.

¹⁵ Smith, 72. Dr. Smith comes to the Maoist comparison from slightly different route, evaluating the potential for creating enough chaos from units acting in concert. These "de-centralized" units would act in ways that are prohibited to "centralized" units.

¹⁶ John B. Wilson, "Influences on the U.S. Army Divisional Organization in the Twentieth Century," Federation of American Scientists Military Analysis Network. December 1995.
<<http://www.fas.org/man/dod-101/army/unit/docs/influncs.htm>> 1 May 2001.

¹⁷ For the discussion of ICBM launchers see Huan, Yang (Major General), "China's Strategic Nuclear Forces" His paper is excerpted from Defense Industry of China, 1949-1989 in Chinese Views of Future Warfare, revised edition, ed. by Michael Pillsbury (Washington D.C.: National Defense University, date unkn.) <<http://www.ndu.edu/inss/books/chinview/chinapt3.html#1>> [26 April 01], 1, and Eshan Ahari, "China's naval forces look to extend their blue-water reach," Jane's Intelligence Review, (1 April 1998), 1. Lkd. at ProQuest, search on Chinese Navy. <[http://proquest.umi.com/ppdweb/?/](http://proquest.umi.com/ppdweb?/)>. [25 April 2001]. Of course, budget issues pay into this decision as well, but the potential for cost savings is an element of Autonomous Warfare as well.

¹⁸ There are a variety of sources and articles debating the advantages and limitations of the infestation operation. See Jon T. Hoffman, "Getting the hunt into Hunter Warrior," Marine Corps Gazette, (Dec 1998), 1-5; John F. Schmitt, "A critique of the Hunter Warrior concept," Marine Corps Gazette, (Jun 1998), 3; and Michael J. Lindermann Jr., "An opposing force perspective of advanced warfighting experiment Hunter Warrior," Marine Corps Gazette, (Jun 1998), 2,3; and Noel Williams, "The limitations of HUNTER WARRIOR," Marine Corps Gazette, (Nov 1998), 1. Williams makes a comparison between the *Pentomic Army* and the Hunter Warrior concept. Lkd. ProQuest query on Hunter Warrior.
<<http://www.proquest.umi.com/pqdweb?>> [1 May 2001].

¹⁹ Carlo Kopp, "The E-Bomb - a Weapon of Electrical Mass Destruction," at
<http://www.infowar.com/mil_c4i/mil_c4i8.html-ssi> [26 April 01], 1. For Psychotronic War, see Timothy L. Thomas, "The Mind Has No Firewall," Parameters, (Spring 1998): 84-92. <<http://carlisle-www.army.mil/usawc/Parameters/98spring/thomas.htm>> [10 Oct 2000].

²⁰ See quote of epigraph.

²¹ See Peter A. Lupsha, "Network vs. Networking: Analysis of an Organized Crime Group," in Career Criminals, ed. Gordon P. Waldo (Beverly Hills, California: Sage Publications, 1983), 59-87. Lupsha's analysis is one of constructing relationships between factual information, but it marks the beginning of understanding the socially networked formation of organized crime.

²² For a discussion of the contrasting comparative evaluation method used by Clausewitz see Michael I. Handel, Masters of War, 2nd ed. (Portland: Frank Cass, 1996), 23.

²³ Fred E. Saalfeld and John F. Petrik, "A Clear Vision," 2000. Lkd. "Sea Systems Contents."
<<http://www.global-defense.com/pages/seamin.html>> [26 April 01], 3. The authors discuss the challenge of integrating mine clearance with the integrated network and the potential of autonomous control theory to this task.

²⁴ Indeed this same weakness is cited in NCW's "lock-out" element. See Thomas P. M. Barnett, "The Seven Deadly Sins of Network-Centric Warfare," Proceeding, 1999. Lkd. at Naval War College site.
<<http://www.nwc.navy.mil/dsd/7deadl~1.htm>> [30 April 2001].

²⁵ Qiao Lang and Wang Xiangsui, 133.

BIBLIOGRAPHY

Books

- Alberts, David S., John J. Garstka and Frederick P. Stein, Network Centric Warfare, 2nd ed. Washington D.C.: C4ISR Cooperative Research Program, 1999.
- Chairman of the Joint Chiefs of Staff. Joint Staff. Joint Warfare of the Armed Forces of the United States, Joint Pub 1. Washington D.C.: 1995.
- Glantz, David M. Soviet Military Strategy in the 1990s: Alternative Futures. Carlisle Barracks, Pennsylvania: U.S. Army War College, 1991.
- Handel Michael I. Masters of War, 2nd ed. Portland: Frank Cass, 1996.
- Kipp, Jacob W., The Russian Military and the Revolution in Military Affairs. Fort Leavenworth, Kansas: Foreign Military Studies Office, 1995.
- Lang, Qiao, and Wang Xiangsui, Unrestricted Warfare: Thoughts on War and Strategy in a Global Era. People's Liberation Army Arts Publishers: Beijing, 1999. Lkd. Terrorism.com at <<http://www.terrorism.com/doucments/unrestricted.pdf>>. [26 April 2001]
- Tzu, Sun. The Art of War, tr. and ed. Samuel B. Griffith. New York: Oxford University Press, 1971.
- Waldo, Gordon P., ed. Career Criminals. Beverly Hills, California: Sage Publications, 1983.
- Xenophon, Anabasis. Lkd. Anicent History Sourcebook (July 1998) at <<http://www.fordham.edu/halsall/ancient/xenophon-anabasis.html>> [9 May 2001]

Articles

- Ahari, Eshan. "China's naval forces look to extend their blue-water reach," Jane's Intelligence Review, (1 April 1998). lkd. at ProQuest/Search/Chinese Navy. <<http://proquest.umi.com/ppdweb?/>> [25 April 2001].
- Barnett, Thomas P. M. "The Seven Deadly Sins of Network-Centric Warfare," Proceeding., 1999. Lkd. at Naval War College site at <<http://www.nwc.navy.mil/dsd/7deadl~1.htm>> [30 April 2001].
- Cebrowski, A. K., and Wayne P. Hughes, Jr., "Rebalancing the Fleet," Proceedings. Lkd. Naval Institute at <<http://www.usni.org/Proceedings/Articles99/PROcebrowski.htm>> [29 April 2001].

-
- Henry, Ryan and C. Edward Peartree, "Military Theory and Information Warfare," from *Parameters*, (Autumn 1998). Lkd. Army War College at <<http://carlisle-www.army.mil.usawc/Parameters/98autumun/henry.htm>> [26 April 2001].
- Hoffman, Jon T. "Getting the hunt into Hunter Warrior," *Marine Corps Gazette*, (Dec 1998) Lkd. at ProQuest/Search/Warrior Hunter. <<http://proquest.umi.com/ppdweb?//>> . [25 April 2001].
- Kopp, Carlo. "The E-Bomb – a Weapon of Electrical Mass Destruction." Lkd. InfoWar.com at <http://www.infowar.com/mil_c4i/mil_c4i8.html-ssi> [26 April 01].
- Layton, Peter. "Network-Centric Warfare: A Place in Our Future." Aerospace Centre Working Papers. Lkd. at Australian Defense at <<http://www.defense.gov.au/aerospacecentre/publish/paper74.htm>> [26 April 2001].
- Lindermann, Michael J., Jr., "An opposing force perceptive of advanced warfighting experiment Hunter Warrior, *Marine Corps Gazette*, (Jun 1998). Lkd. at ProQuest/Search/Warrior Hunter. <<http://proquest.umi.com/ppdweb?//>> [25 April 2001].
- Morgan, Patrick. "The Impact of the Revolution of Military Affairs," *The Journal of Strategic Studies*, 23.1 (March 2000): 132-162.
- Pillsbury, Michael. *Chinese Views of Future Warfare*, revised edition (Washington D.C.: National Defense University, date unkn.). Lkd. National Defense University at <<http://www.ndu.edu/inss/books/chinview/chinapt3.html#1>> [26 April 01].
- Saalfeld, Fred E. and John F. Petrik, "A Clear Vision," 2000. Lkd. Sea Systems Contents at <<http://www.global-defense.com/pages/seamin.html>> [26 April 01].
- Schmitt, John F. "A critique of the Hunter Warrior concept," *Marine Corps Gazette*, (Jun 1998). Lkd. at ProQuest/Search/Warrior Hunter. <<http://proquest.umi.com/ppdweb?//>> [25 April 2001].
- Smith, Edward A., Jr. "Network-centric Warfare," *Naval War College Review*, vol. LIV, no. 1 (Winter 2001): 59-75.
- Thomas, Timothy L. "The Mind Has No Firewall," *Parameters*, (Spring 1998). Lkd. Army War College at <<http://carlisle-www.army.mil/usawc/Parameters/98spring/thomas.htm>> [10 Oct 2000].

Williams, Noel. "The limitations of HUNTER WARRIOR," Marine Corps Gazette, (Nov 1998). lkd. at ProQuest/Search/Warrior Hunter.
<<http://proquest.umi.com/ppdweb?/>> [25 April 2001].

Wilson, John B. "Influences on the U.S. Army Divisional Organization in the Twentieth Century," Federation of American Scientists Military Analysis Network.
December 1995. <<http://www.fas.org/man/dod-101/army/unit/docs/influncs.htm>>
1 May 2001.

Unpublished Papers

Davidson, William G. "The NIOP: the Naval Integrated Operations Plan." Unpublished
Research Paper, U. S. Defense Intelligence College, Washington, D.C.: 1987.